Rethinking the Impossible: Net Zero Water Footprinting Strategies

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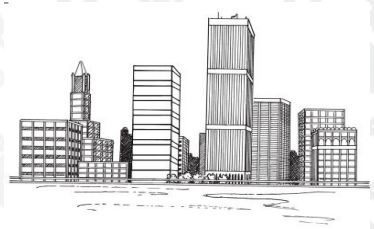
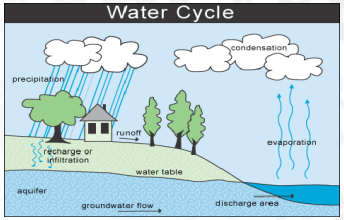
Net Zero Water Balance: Supply

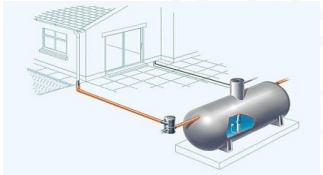
Water Supply



Municipal Water



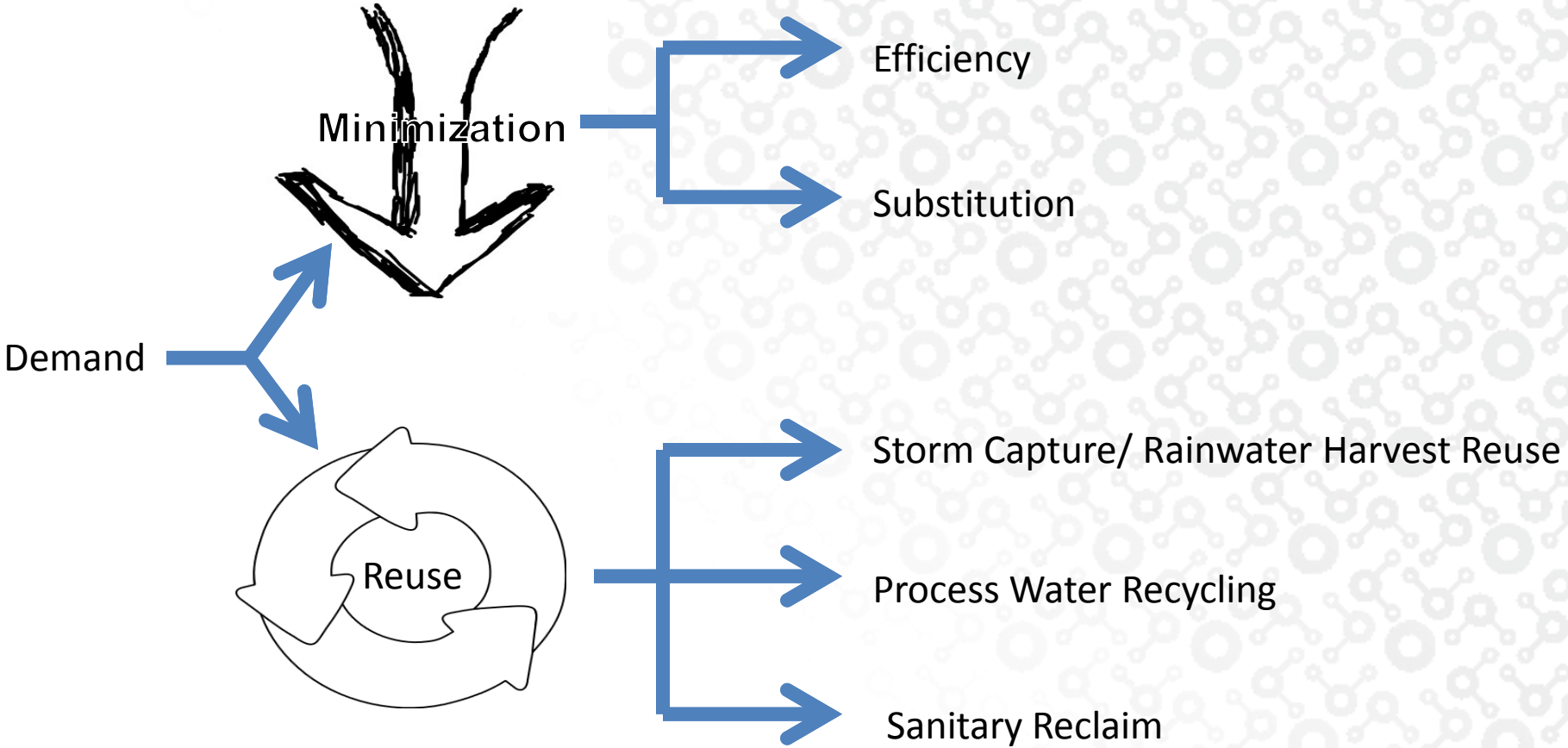
Groundwater Well



Rainwater Harvest

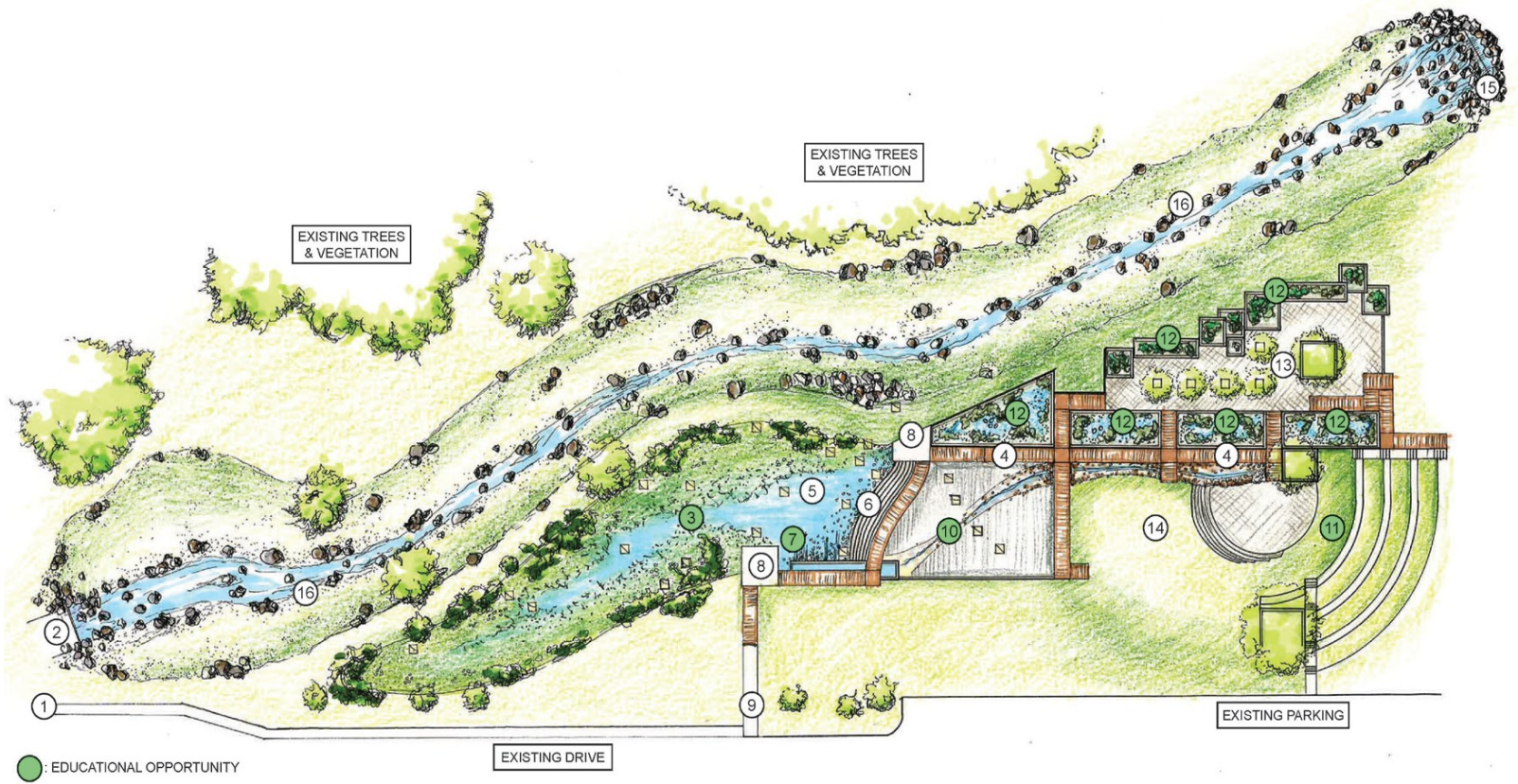
Condensate Recovery (Arid Climates)

Net Zero Water Balance: Demand



Net Zero Water: Scale Jump

Scale Jump → Localized Aquifer Recharge



Presentation Learning Objectives

1) Examples of how Water Footprinting supports an organization's sustainability planning and reporting initiatives

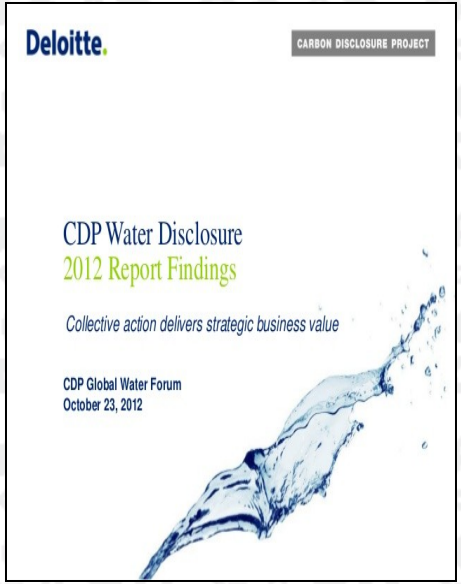
2) Identification of onsite water sources and the various water quality considerations associated with their ends uses

3) Knowledge of building and site features to accomplish net zero water

Sustainability Planning and Reporting

Corporate Reporting

- 76% of world's largest 250 companies address water in corporate responsibility reporting (KPMG Survey-October 2012)
- Data disclosures lagging
- Corporate mandates
- Certifications



CARBON TRUST STANDARD
REDUCING WATER YEAR ON YEAR

THE GLOBAL COMPACT

The CEO Water Mandate

Reporting Initiatives

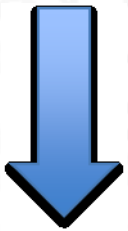
- Global Reporting Initiative
- ISO 14001
- American College & University Presidents' Climate Commitment

www.uswateralliance.org

The Water Footprinting Process

Quantify

Evaluate



Implement

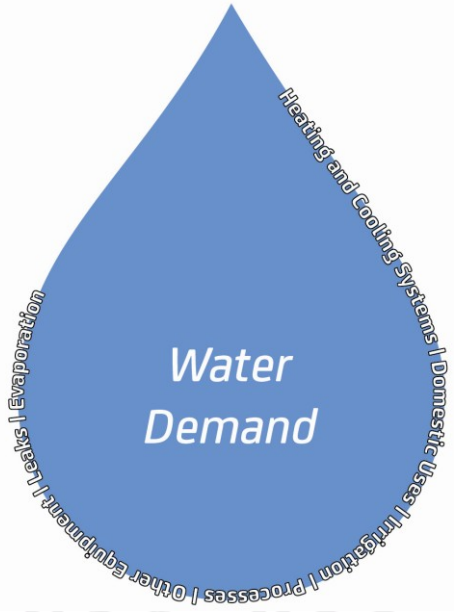
Quantify

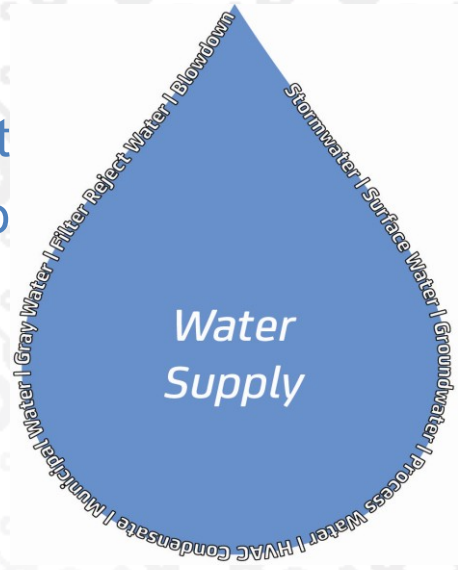
Conduct an external/internal process review to determin

- Current sources at facility
- Current uses at facility
- Current disposition of water
- Generates facility water balance and facility water us

Example Facility-Tobacco Processor:

- Tobacco flavoring meters identified as cooling tower met
- Correlation between billed meter locations vs. facility plo plan





Evaluate

Identify opportunities to **minimize**, **reuse** and **replace** water onsite

Examples:

- Low flow fixtures and fittings
- HVAC and boiler steam condensate reuse
- Reject process water (i.e. Reverse Osmosis, Nanofiltration)
- Graywater reuse

Example Facility-Hospital:

- Single Pass Cooling
- Onsite well for cooling tower makeup
- High efficiency Pre-Rinse Spray Valves

Implement

Water Management Action Plan to move the facility to a net zero water balance:

- Stormwater infiltration basins for onsite groundwater recharge
- Installation of conductivity meters and controls on cooling towers
- Rainwater harvesting for toilet flushing and coo makeup

Example Facility-Orthopedics Manufacturer:

- Update of existing R/O treatment system
- Infiltrate stormwater to onsite well for non-conta process water, irrigation and fire suppression

Implement

Example Facility-Precision Electronics Manufacturer:

- Submetering program to define water demands/losses by process
- Alternate Rinsing Configurations and Automatic Rinse Controllers
- Low flow aerators on sink faucets

Example Facility-Municipal City Hall:

- Use of harvested stormwater for flushing toilets
- Pretreatment and conveyance system for disconnecting basement sumps

Water Footprinting- Results

Location	Facility Type	Current Annual Use	Potential Annual Savings
Nashville, Tennessee	Hospitals (7)	188M Gallons -total for all hospitals	**$100,000 per hospital and 66% water use reduction**
	Tobacco processing and packaging facility	21M Gallons	**$34,000 and 60% water use reduction**
Wendell, North Carolina	Precision electronics manufacturing facility	13M Gallons	**$45,000 and 90% water use reduction**
Wabash, Indiana	Orthopedics manufacturer	35M Gallons	**62% water use reduction**
Indianapolis, Indiana	Municipal City Hall	14M Gallons	**$20,000 and 75% water use reduction**

Case Study-Net Zero Water Tyson Living Learning Center

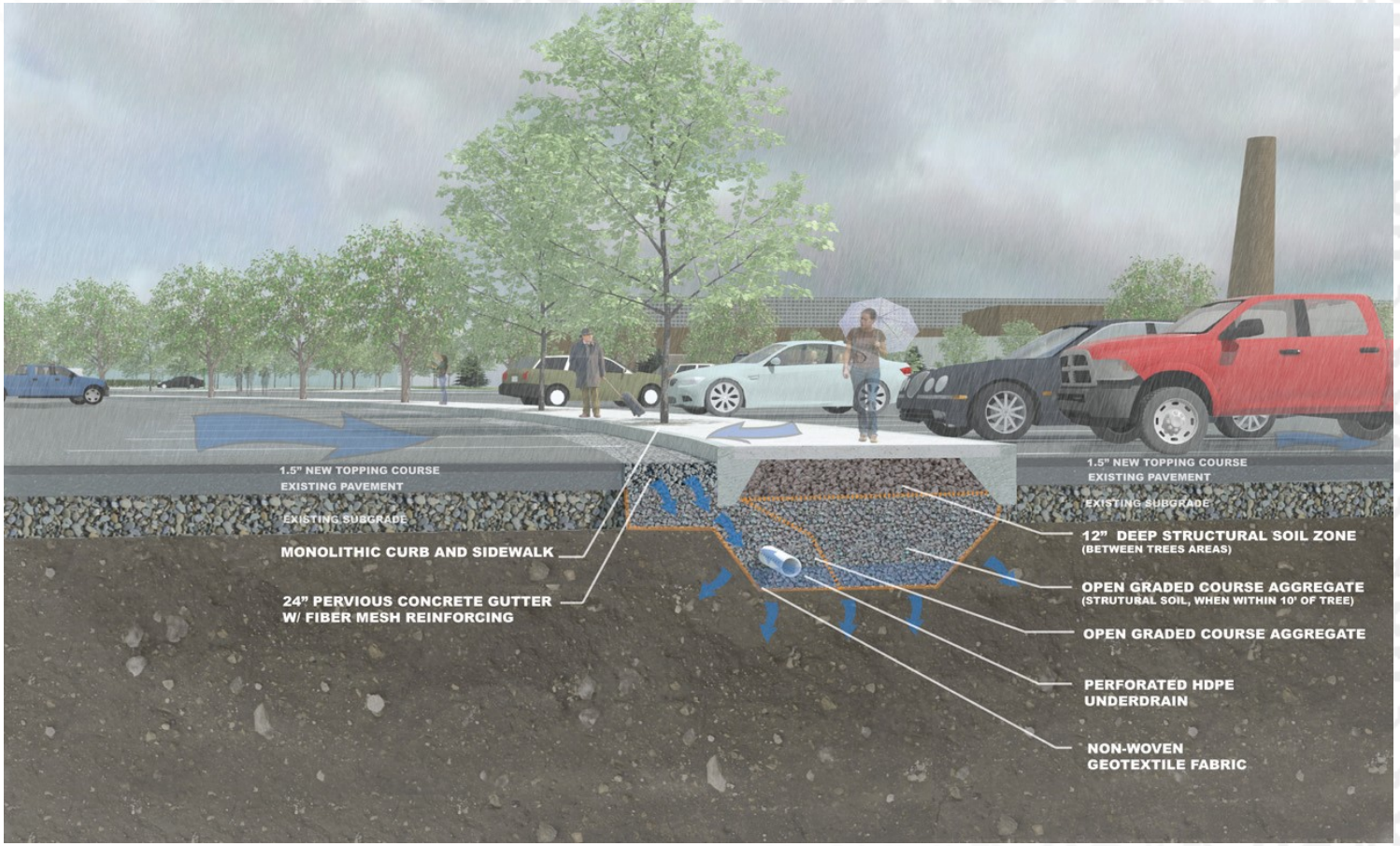
Net Zero Water-Building Scale

- RAINWATER HARVESTING
- POTABLE WATER SYSTEM
- GREYWATER SYSTEM
- WASTEWATER SYSTEM

Tyson Living Learning Center- Rainwater Collection System

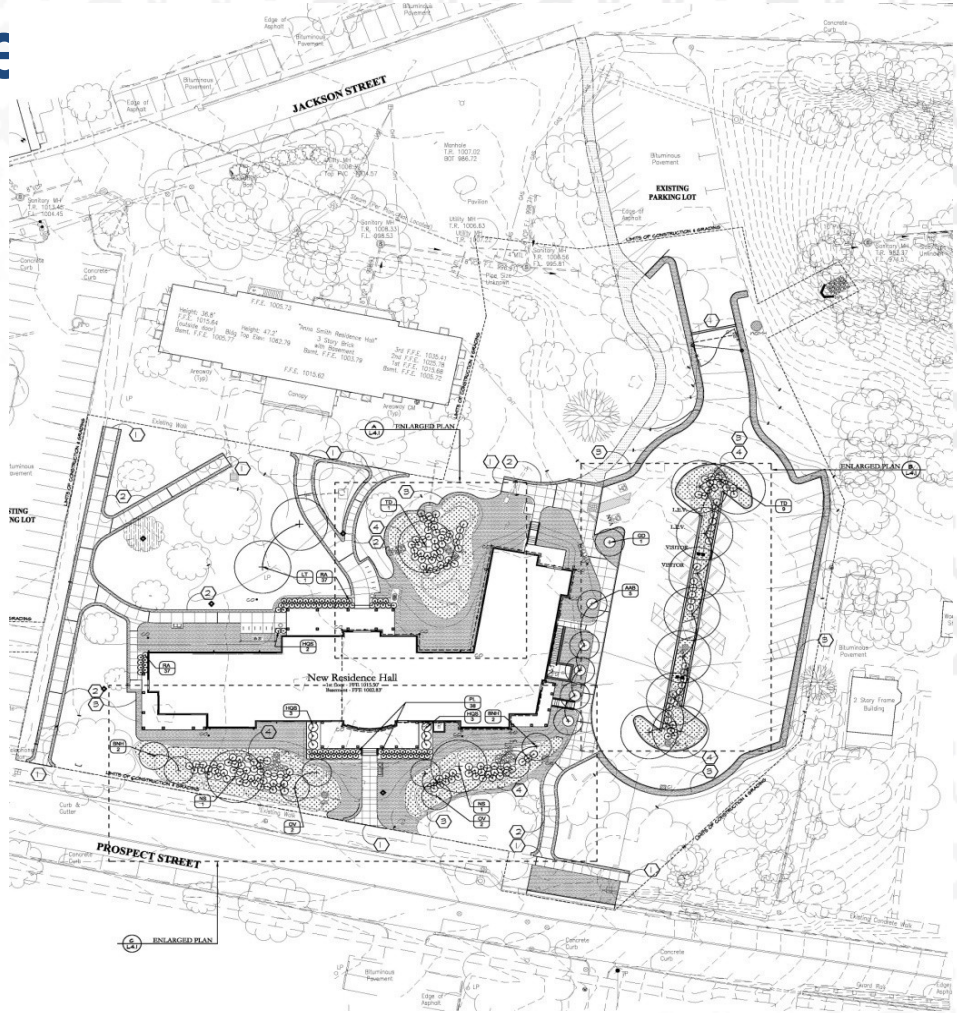
- Rainwater collection and treatment system (potable drinking water source)
- Water collected on metal roof and stored in in-ground tank
- Water is then pumped through a secondary filtration

Alcoa-Net Zero Parking Lot



Alcoa Net Zero Parking Lot

Berea College-Deep Green Student Reside



Berea College-Scaling Up to Net

Strategy:

1. Minimize Potable Water Offsite Demand
2. Maintain Predevelopment Hydrologic Cycle
3. Aquifer Supply Recharge Onsite
   - Treated Grey Water
   - Treated Black Water

Aquifer is Nature's Cistern!

Thank you!

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